of New England and Nova Scotia, a storm of considerable strength was central between the Azores and the Banks of Newfoundland, the pressure was low north and northwest of the British Isles, and west to north gales of force 10 to 11 were encountered west of the 50th meridian. By the 2d the storm over the western part of the ocean had advanced to the Grand Banks, and the storm which occupied mid-ocean had moved northward, with pressure falling below 29.00 (736) and northwesterly gales of force 8 to 9. By the 3d these storms had disappeared north of the region of observation. The severest storms of the month over the western part of the ocean attended the passage of low area II from the North Carolina coast to the Banks of Newfoundland during the 4th and 5th. The morning of the 4th this storm was central off the North Carolina coast, with pressure below 29.20 (742). During that date the storm-center moved slowly northeastward, with pressure below 28.80 (731), and northwesterly gales of hurricane force west of the 65th meridian, and by the morning of the 5th had crossed the trans-Atlantic steamship routes and reached the Banks of Newfoundland without an apparent loss of energy. By the morning of the 6th this disturbance had disappeared north of the Banks of Newfoundland. The afternoon of the 9th low area IV moved off the New Jersey coast. During the 10th this storm moved southeastward in the direction of Bermuda, its passage being unattended by noteworthy features.

From the 11th to the 16th the pressure continued low over and near the British Isles. A barometric depression apparently occupied the ocean west of the British Isles from the 11th to the 14th, passed over Great Britain during the 15th, and reached the North Sea by the 16th. During the 13th and 14th low area V occupied the ocean south of Nova Scotia. The morning of the 15th low area VI was central on the New England coast, with pressure below 29.40 (747), and during that date passed northeastward over New Brunswick, with pressure falling below 29.30 (744), and west to north gales of force 8 to 10 west of the 65th meridian. During the 16th this storm disappeared north of Newfoundland. During the 17th low area VII passed off the south Atlantic coast, and the morning of the 18th was central about midway between Bermuda and Nova Scotia.

During the 18th the storm-center moved northeastward over the trans-Atlantic steamship routes, with pressure below 29.00 (736) and gales of hurricane force, and during the 19th passed over the Banks of Newfoundland, with an apparent loss of energy. From the 20th to the 25th this storm occupied mid-ocean, and on the 21st and 22d was attended by gales of hurricane force north of the Azores. By the 26th the center of disturbance had apparently passed southeast of the Azores. On the 25th low area IX passed eastward over northern Newfoundland. During the 26th and 27th this storm moved southeastward over mid-ocean, and by the 28th had disappeared in the direction of the Spanish Peninsula. The night of the 26th low area X advanced from the Gulf of Mexico over the Florida Peninsula, passed thence northeastward over the Grand Banks by the morning of the 29th, and thence eastward to the British Isles by the close of the month.

OCEAN ICE IN MARCH.

The following table shows the southern and eastern limits of the region within which icebergs or field ice were reported for March during the last 12 years:

Southern limit.			Eastern limit.		
Month.	Lat. N.	Long. W.	Month.	Lat. N.	Long. W.
	° ′	° ′		° ′	° ′
March, 1882	42 30	50 00	March, 1882	46 30	46 00
March, 1883	41 46	49 48	March, 1883	48 40	43 03
March, 1884	41 20	54 06	March, 1884	45 00	40 15
March, 1885	40 55	49 04	March, 1885	45 57	43 15
March, 1886	40 20	49 02	March, 1886	47 20	44 40
March, 1887	41 00	49 07	March, 1887	45 31	42 56
March, 1888	42 30	50 37	March, 1888	47 23	46 56
March, 1889	44 20	53 00	March, 1889	44 20	53 00
March, 1890	41 01	50 54	March, 1890	46 40	39 50
March, 1891	42 25	50 30	March, 1891	49 00	43 44
March, 1892	43 58	48 15	March, 1892	43 58	48 15
March, 1893	44 35	50 13	March, 1893	45 55	46 56
Mean	42 14	50 23	Mean	46 22	44 55

The limits of the region within which icebergs or field ice were reported for March, 1893, are shown on Chart I by ruled shading. The southernmost ice reported, a small, rounded iceberg, noted on the 30th, was about 2½° north of the average southern limit, and the easternmost ice observed, a lump of ice noted on the 17th in the position given in the table, was about 2° west of the average eastern limit of ice for March. Icebergs were reported near the east edge of the Banks of Newfoundland on the 2d, 27th, and 30th. Field ice was encountered over or near the northeastern part of the Grand Banks on the 9th, 13th, 17th, 18th, 19th, 28th, and 29th. Field ice was noted near Cape Breton Island and eastern Nova Scotia on the 5th, 8th, 19th, 22d, 24th, and 30th.

OCEAN FOG FOR MARCH.

The limits of fog belts west of the 40th meridian, as reported by shipmasters, are shown on Chart I by dotted shading. East of the 55th meridian fog was reported on 7 dates; between the 55th and 65th meridians on 10 dates; and west of the 65th meridian on 8 dates. Compared with the corresponding month of the last 5 years the dates of occurrence of fog east of the 55th meridian numbered 2 greater than usual; and west of the 55th meridian 3 greater than usual. The fog reported was generally noted in the east quadrants of general storms.

TEMPERATURE OF THE AIR (expressed in degrees Fahrenheit).

The distribution of mean temperature over the United States and Canada for March, 1893, is exhibited on Chart II by dotted isotherms. In the table of miscellaneous meteorological data the monthly mean temperature and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for mean temperature and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the temperature is below the normal and subtracting when above. The monthly mean temperature for regular stations of the Weather Bureau represents the mean of the maximum and minimum temperatures.

The mean temperature was highest over the extreme southern part of the Florida Peninsula, where it was above 70. The mean temperature was above 60 over the entire Florida Peninsula, along the middle Gulf coast, in Texas south of the 30th parallel, and in the Gila and lower Colorado valleys. The mean temperature was lowest in the British Northwest Territory north of North Dakota and eastern Montana, where it was below 10. In the mountains of central Colorado the mean values were below 20. In central and northern New England, and north of a line traced from east-central New York over the southern lake region and the extreme upper Mississippi valley to northeastern Wyoming, thence to north-central New Mexico, and thence irregularly northwestward to northwestern Montana the mean temperature was below 30.

The mean readings were also below 30 at stations in the Sierra Nevada Mountains between the 38th and 40th parallels.

DEPARTURE FROM NORMAL TEMPERATURE.

The mean temperature was below the normal, except in parts of the Ohio and Saint Lawrence valleys and the Lake region, and at Key West, Fla. The most marked departure below the normal was noted in northeastern Montana and the British Possessions to the northward, where the month was 10 or more colder than usual. The departure below the normal was more than 4 from western Colorado over the northeast slope of the Rocky Mountains, in the middle and upper Missouri, extreme upper Mississippi, and Red River of the North valleys, and in an area covering the interior of southern California. The greatest departure above the normal temperature was noted in Ontario and western Quebec, where the month was 2 to 3 warmer than usual.

The following table shows for certain stations, as reported by voluntary observers, (1) the normal temperature for March for a series of years; (2) the length of record during which the observations have been taken, and from which the normal has been computed; (3) the mean temperature for March, 1893; (4) the departure of the current month from the normal; (5) and the extreme monthly mean for March during the period of observation and the years of occurrence:

State and station.	(1) Normal for the month of March.	(2) Length of record.	(3) Mean for March, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for March.			
					Highest.	Year.	Lowest.	Year.
Arizona.	°	Years	°	°	°		°	
Fort Apache	46.1	21	43.4	— 2.7	53.8	1879	41.3	1875
Fort Mohave	63.7	22	60.6	— 3.1	70.5	1879	58.0	1886
Whipple Barracks	45.6	21	41.4	— 4.2	53.8	1879	38.7	1886
Arkansas.								
Keesees Ferry	47.8	11	47.0	— 0.8	55.4	1882	45.0	1891
California.								
Fort Bidwell	40.4	22	35.1	— 5.3	49.3	1883	31.2	1874
Riverside	56.6	11	51.5	— 5.1	61.6	1885	51.5	1893
Colorado.								
Las Animas	40.0	11	39.8	— 0.2	45.4	1887	33.2	1891
Florida.								
Merritts Island	66.0	11	66.6	+ 0.6	71.4	1882	61.6	1889
Georgia.								
Forsyth	56.6	19	57.8	+ 1.2	61.7	1880,'82	51.4	1885
Idaho.								
Boise Barracks	43.2	19	38.7	— 4.5	49.1	1889	36.8	1882
Fort Sherman	38.6	9	34.2	— 4.4	43.6	1889	33.2	1882
Indiana.								
Lafayette	35.8	13	38.3	+ 2.5	41.3	1882	29.6	1885
Indian Territory.								
Fort Supply	44.7	14	47.4	+ 2.7	52.6	1882	37.4	1876
Iowa.								
Cresco	25.2	21	25.3	+ 0.1	42.3	1878	19.6	1888
Kansas.								
Eureka Ranch	40.3	10	38.6	— 1.7	46.0	1889	34.1	1891
Independence	44.5	21	44.9	+ 0.4	54.1	1878	36.7	1876
Salina	40.0	10	.....	.....	45.0	1889	34.3	1891
Louisiana.								
Grand Coteau	61.2	10	59.5	— 1.7	66.2	1884	57.6	1892
Maine.								
Orono	27.5	23	.....	.....	34.6	1871	19.1	1885
Maryland.								
Cumberland	37.0	22	39.2	+ 2.2	46.0	1878	30.0	1875
Michigan.								
Kalamazoo	31.2	17	33.5	+ 2.3	42.2	1878	22.5	1885
Missouri.								
Sedalia	41.4	10	40.7	— 0.7	48.1	1889	36.1	1891
Montana.								
Fort Custer	32.7	11	29.9	— 2.8	40.8	1889	23.0	1888
Nebraska.								
Fort Robinson	34.2	9	32.6	— 1.6	43.0	1889	24.8	1891
Genoa (near)	32.2	17	29.7	— 2.5	43.6	1878	23.8	1876
Nevada.								
Browns	46.8	21	44.1	— 2.7	52.8	1879	37.7	1880
Carson City	41.4	16	39.5	— 1.9	50.1	1877	33.5	1880
New Hampshire.								
Hanover	27.8	22	27.2	— 0.6	35.5	1871	19.0	1872, 1875
New Mexico.								
Fort Wingate	42.1	22	38.3	— 3.8	51.1	1879	34.3	1886
New York.								
Cooperstown	27.3	22	28.5	+ 1.2	37.2	1871	18.3	1885
Plattsburg Barracks	26.7	22	24.8	— 1.9	35.0	1871	16.7	1885
North Carolina.								
Lenoir	45.4	19	46.8	+ 1.4	51.6	1878	35.0	1877
Oklahoma.								
Fort Reno	48.2	9	48.8	+ 0.6	52.8	1887	45.5	1891
Fort Sill	51.1	21	49.8	— 1.3	59.3	1879	42.0	1876
Oregon.								
Bandon	46.8	9	46.7	— 0.1	50.8	1889	41.5	1886

Departures from normal temperature—Continued.

State and station.	(1) Normal for the month of March.	(2) Length of record.	(3) Mean for March, 1893.	(4) Departure from normal.	(5) Extreme monthly mean for March.			
					Highest.	Year.	Lowest.	Year.
Pennsylvania.	°	Years	°	°	°		°	
Dyberry	28.6	22	28.6	0.0	36.9	1878	19.5	1885
Grampian	30.4	22	32.0	+ 1.6	40.4	1878	20.1	1885
Wellsboro	30.6	13	29.1	— 1.5	37.0	1882	22.4	1885
South Carolina.								
Statesburg	52.6	12	53.3	+ 0.7	59.0	1882	48.3	1885
South Dakota.								
Fort Sully	29.2	22	26.6	— 2.6	44.5	1878	15.9	1876
Texas.								
Austin	60.4	21	59.6	— 0.8	66.8	1879	53.0	1872
Silver Falls	51.4	7	53.9	+ 2.5	56.7	1887	47.7	1891
Utah.								
Terrace	42.3	'21	35.2	— 7.1	51.3	1889	28.3	1875
Vermont.								
Strafford	26.0	20	25.2	— 0.8	33.8	1878	17.2	1883
Virginia.								
Dale Enterprise	41.5	13	41.8	+ 0.3	47.1	1880	32.1	1885
Washington.								
Fort Townsend	44.6	20	43.0	— 1.6	50.7	1885	38.7	1880
West Virginia.								
Parkersburg	41.7	11	42.0	+ 0.3	52.8	1882	36.7	1890
Wisconsin.								
Embarrass	26.0	21	.....	.....	42.3	1878	19.2	1872
Madison	29.3	22	28.7	— 0.6	43.9	1878	23.2	1888
Wyoming.								
Fort Washakie	33.4	10	30.1	— 3.3	41.0	1887	26.8	1891

TEMPERATURE, JANUARY TO MARCH.

For the period January 1 to March 31, 1893, the mean temperature averaged 2 to 4 below the normal in the New England, middle and south Atlantic, and east Gulf states, at Key West, Fla., in the Ohio Valley and Tennessee, the Lake region, the upper Mississippi and Missouri valleys, on the middle-eastern slope of the Rocky Mountains, over the middle and northern plateau regions, and along the middle and north Pacific coasts, and was about 1 below the normal on the northeast slope of the Rocky Mountains. In the extreme northwest and on the southeast slope of the Rocky Mountains the mean temperature was about 1 above the normal. In the west Gulf states, over the southern plateau region, and along the south Pacific coast the mean temperature averaged about normal for the period named.

YEARS OF HIGHEST MEAN TEMPERATURE FOR MARCH.

The highest mean temperature for March was noted in Washington and Oregon, along the immediate middle Pacific coast, and in the extreme northwest in 1889; over northern and western Florida and southern Georgia in 1880; from the east part of the middle plateau region over the west Gulf states in 1879; from the middle-eastern slope of the Rocky Mountains over the Lake region to the Atlantic coast north of Georgia in 1878, except in Pennsylvania, where the highest mean was noted in 1871.

YEARS OF LOWEST MEAN TEMPERATURE FOR MARCH

At Havre, Mont., and Red Bluff and Riverside, Cal., the mean temperature for the current month was the lowest reported for March during the respective periods of observation. The lowest mean temperature for March was noted at points in the interior of the middle Gulf states and along the Texas coast in 1892; from the middle-eastern slope of the Rocky Mountains and the lower Missouri valley over the greater part of Texas in 1891; from the northeast slope of the Rocky Mountains to the extreme upper Mississippi valley in 1888; from the east Gulf coast over the central and eastern lake regions and New England in 1885, except at stations on the immediate New England coast; along the Pacific coast in 1880; in the middle Mississippi valley, and at points on the New England, New York, and south Atlantic coasts in 1872.

MAXIMUM TEMPERATURE.

At Columbus and Cincinnati, Ohio, Springfield, Mo., Concordia, Kans., and Helena, Mont., the maximum temperature for the current month was the highest ever noted for March.

The highest temperature reported by a regular station of the Weather Bureau in March, 1893, was 97, at Yuma, Ariz., on the 28th. The maximum temperature reached 92 at Tucson, Ariz., on two or more dates, and a reading of 90 was noted at Abilene, Tex., on the 31st. In the Gulf States, except along the middle Gulf coast, the maximum temperature was above 80. Maximum temperature above 80 was also reported in Florida, central and southern Georgia, the interior of South Carolina, from the lower Missouri valley and the middle-eastern slope of the Rocky Mountains to the Rio Grande River, over south and west parts of the southern plateau region, and over the southern half of California, except in the Sierra Nevada Mountain districts and on the southern coast. Reports of voluntary observers show maximum temperature above 100 in the lower Colorado valley, Arizona, and in the Colorado Desert, California. The lowest maximum temperature, 41, was noted at Moorhead, Minn.; the maximum values were below 50 in the Lake Superior region and the Red River of the North Valley, and were below 55 on the southeast New England and extreme north Pacific coasts.

MINIMUM TEMPERATURE.

At Savannah and Atlanta, Ga., Chattanooga, Tenn., Cairo, Ill., and Little Rock, Ark., the minimum temperature was as low, and at Charlotte, N. C., Memphis, Tenn., Fort Smith, Ark., Moorhead, Minn., and Los Angeles, Cal., it was lower than previously reported for March.

The lowest temperature reported by a regular station of the Weather Bureau, 26 below zero, was noted at Saint Vincent, Minn., on the 4th and 15th. In the Red River of the North Valley and over the eastern half of North Dakota the minimum temperature fell below —20, and the minimum values were below zero over the northern lake region, in the middle and upper Missouri and extreme upper Mississippi valleys, and on the middle and northeast slopes of the Rocky Mountains. The minimum temperature was also below zero over northern New England. The highest minimum temperature, 56, was noted at Key West, Fla.; the minimum readings were 40, or above, over the southern part of the Florida Peninsula, along the immediate middle and west Gulf coasts, and at San Francisco and San Diego, Cal.

LIMITS OF FREEZING WEATHER.

The southern limit of freezing weather is shown on Chart V by a line traced southwestward over the Florida Peninsula to Tampa, Fla., and from the middle Gulf coast westward over Texas north of San Antonio. The western limit of freezing weather is shown by a line traced along the immediate north Pacific coast to extreme northwestern California, and thence over the central valleys of California, extreme southern Nevada, and western Arizona.

RANGES OF TEMPERATURE.

The greatest daily range of temperature is shown in the table of miscellaneous meteorological data. The greatest monthly range of temperature, 93, was noted at North Platte, Nebr., and the range exceeded 80 along the middle-eastern and northeastern slopes of the Rocky Mountains. From the middle and northern Rocky Mountain regions the monthly ranges decreased eastward to less than 40 on the south New England coast, and to 40 at Hatteras, N. C., southeastward to less than 30 at Key West, Fla., and Port Eads, La., southwestward to less than 40 on the extreme south Pacific coast, and westward to less than 30 on the immediate north Pacific coast.

COLD WAVES.

A severe cold wave overspread the Southwest on the 3d, and extended to the south Atlantic coast on the 4th, with a fall in temperature of 30 to 40 in the Gulf and south Atlantic states, freezing weather to Charleston, S. C., Montgomery, Ala., and Meridian, Miss., and the lowest temperature on record for March at points in Tennessee and Arkansas. The morning of the 5th the temperature fell below the freezing point over the northern part of the Florida Peninsula, and reached 32 at New Orleans, La. The second important cold wave of the month appeared over the Rocky Mountain regions on the 12th, overspread the Missouri Valley on the 13th with a fall in temperature of 30 to 40, extended over the middle and upper Mississippi valleys, and from the western lake region to the northern part of the east Gulf states on the 14th, and reached the Atlantic coast on the 15th, with freezing weather to the north part of the east Gulf states. The morning of the 16th the temperature fell to 31 at Wilmington, N. C. From the 21st to the 23d a cold wave swept over the northern part of the country from the eastern Saskatchewan valley to the New England coast. From the 23d to the 25th a moderate cold wave advanced from the Western States over the central valleys.

FROST.

On the 5th frost occurred generally over the northern part of the Florida Peninsula. At Tampa, Fla., the temperature fell to 31.9, and frost damaged young fruit and vegetables. At Titusville, Fla., the temperature fell to 34 and frost damaged tender vegetation. At Pensacola, Fla., the temperature fell to 28, and garden vegetables in that section were killed by frost. On the 6th heavy frost was reported at Montgomery, Ala., and light frost at Savannah, Ga., and Charleston, S. C. Light frost occurred in southern Arizona on the 10th. On the 18th frost killed fruit blooms about Dallas, Tex. On the 19th low temperature and heavy frost damaged tender vegetation in the east Gulf and south Atlantic states. Tender plants in North Carolina were nipped by frost on the 20th. On the 29th light frost was reported in northern Louisiana, and peach blossoms were injured in northern Arkansas. Light frost was noted at points in the interior of the Gulf and south Atlantic states the morning of the 30th.

PRECIPITATION (expressed in inches and hundredths).

The distribution of precipitation over the United States and Canada for March, 1893, as determined from reports of more than 2,000 stations, is exhibited on Chart III. In the table of miscellaneous meteorological data the total precipitation and the departure from the normal are given for regular stations of the Weather Bureau. The figures opposite the names of the geographical districts in the columns for precipitation and departure from the normal show, respectively, the averages for the several districts. The normal for any district may be found by adding the departure to the current mean when the precipitation is below the normal and subtracting when above.

In March the normal precipitation is greatest at points along the Pacific coast north of the 42d parallel and at stations in the Sierra Nevada Mountains between the 37th and the 40th parallels, where it exceeds 8.00. It exceeds 6.00 over a great part of the Gulf States east of the 95th meridian and in southeastern Tennessee and western parts of the Carolinas